CLAIMS

1. A template type substrate used for opto-electric or electrical devices which comprises A) a layer of bulk mono-crystal nitride containing at least one element of alkali metals (Group I, IUPAC 1989) and B) a layer of nitride grown by means of vapor phase epitaxy growth wherein the layer A) and the layer B) are combined at non N-polar face of the layer A) and N-polar face of the layer B).

2. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the layer A) of bulk mono-crystal nitride includes gallium or aluminum-containing nitride and aluminum-containing nitride and is represented by the general formula of $Al_xGa_{1-x}N$ wherein $0 \leq x \leq 1$.

3. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the layer B) of nitride grown by means of vapor phase epitaxy growth is represented by the general formula of $Al_xGa_{1-x-y}In_yN$, where $0 \leq x \leq 1$, $0 \leq y \leq 1$, $0 \leq x+y \leq 1$.

4. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the layer B) is prepared on a substrate having the layer A) by means of MOCVD, HVPE or MBE.

5. A template type substrate used for opto-electric or electrical devices according to claim 4, wherein the layer

B) is composed of at least two layers and the first layer B1) is prepared on a substrate having the layer A) by means of MOCVD or MBE and the second layer B2) is prepared on the first layer B1) by means of HVPE.

6. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the layer A) of bulk mono-crystal nitride is prepared on a seed having the layer B) by crystallization of nitride in a supercritical ammonium solution containing at least one element of alkali metals.

7. A template type substrate used for opto-electric or electrical devices according to claim 1, which further comprises C) a layer of gallium or aluminum-containing nitride grown by means of vapor phase epitaxy growth wherein the layer A) of bulk mono-crystal nitride containing at least one element of alkali metals (Group I, IUPAC 1989) is prepared on both of non N-polar face and N-polar face of the seed layer B) as layers A1) and A2) and the layer C) is combined at non N-polar face of the layer A1) and N-polar face of the layer C).

8. A template type substrate used for opto-electric or electrical devices according to claim 7, wherein the layer C) of the gallium or aluminum-containing nitride is prepared on a substrate of the layer A1) by means of MOCVD, HVPE or MBE.

9. A template type substrate used for opto-electric or electrical devices according to claim 7, wherein the layer C) is composed of at least two layers and the first layer C1) is prepared on a substrate of the layer A1) by means of MOCVD or MBE and the second layer C2) is prepared on the first layer C1) by means of HVPE.

10. A template type substrate for opto-electric or electrical devices according to claim 1, wherein the substrate contains chloride and has a main surface substantially consisting of Ga-polar face.

11. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the substrate has a dislocation density of $10^6/cm^2$ or less.

12. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the layer A) or the layers A1) and A2) are of bulk mono-crystal nitride prepared by crystallization of nitride in a supercritical ammonium solution containing at least one element of alkali metals.

13. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the layer A), having a pair of C-plane surfaces and a diameter of 1 inch or more, is prepared by A-axis direction growth of bulk mono-crystal nitride in a supercritical ammonium solution containing at least one element of alkali metals.

14. A template type substrate used for opto-electric or electrical devices according to claim 13, wherein the substrate has a dislocation density of $10^4/cm^2$ or less.

15. A template type substrate used for opto-electric or electrical devices according to claim 1, wherein the concentration of at least one alkali metal in the gallium or aluminum-containing nitride layer B) or C) and layers B1) and B2) or C1) and C2) is lower than that in the layer A) prepared by crystallization of nitride in a supercritical ammonium solution containing at least one element of alkali metals.

16. A template type substrate used for opto-electric or electrical devices according to claim 2, wherein the nitride layer A) is composed of AlN or GaN.

17. A template type substrate used for opto-electric or electrical devices according to any one of claims 1, 5, 7 and 9, wherein the layer B), B1), C) or C1) is prepared by MOCVD and has a thickness of 0.1 to 3 μm.

18. A template type substrate for opto-electric or electrical devices according to claim 17, wherein the layer B) or C) obtained by the growth method from the gaseous phase has the general formula of $Al_xGa_{1-x-y}In_yN$, where $0 \leq x \leq 1$, $0 \leq y < 1$, $0 \leq x+y \leq 1$.

19. A template type substrate used for opto-electric or electrical devices according to claim 18, wherein the layer

B) or C) is combination of double layers AlGaN and GaN.

20. A template type substrate used for opto-electric or electrical devices accroding to claim 1 or 8, wherein the layer B) or C) is a gallium or aluminum-containing nitride containing silicon (Si) or oxygen (O) as donor dopants.

21. A template type substrate used for opto-electric or electrical devices accroding to claim 1 or 7, wherein the layer B) or C) is a gallium or aluminum-containing nitride containing magnesium (Mg) or zinc (Zn) as acceptor dopants.

22. A template type substrate for opto-electric or electrical devices accroding to claim 20 or 21, wherein the concentration of dopants ranges between $10^{17}/cm^3$ and $10^{21}/cm^3$.

23. A process of preparing a template type substrate which comprises steps of:

(a) preparing a layer A) of bulk mono-crystal nitride containing at least one element of alkali metals (Group I, IUPAC 1989) to have a thichness for substrate by crystallization of gallium or aluminum-containing nitride on a seed from a super-critical ammonia-containing solution, and (b) forming a layer B) of nitride by means of vapor phase epitaxy growth on Al or Ga-polar face of the layer A) to get a substrate comprising the layer A) and the layer B) combined at Al or Ga-polar face of the layer A) and N-polar face of the layer B).

24. A process of preparing a template type substrate

according to claim 23, which comprises further step of (c) polishing one of the faces of the layer B) to get a substrate for vapor phase epitaxy.

25. A process of preparing a template type substrate according to claim 24, which comprises further step of annealing the substrate comprising the layers A) and B) in the atmosphere that does not contain hydrogen but does contain oxygen at temperature between approx. 600 and 1050°C, thus producing material with better crystalline quality than before the annealing.

26. A process of preparing a template type substrate according to claim 25, wherein the step of annealing is carried out in the atmosphere of inert gas with an addition of oxygen between 10 and 30 vol.%.

27. A process of preparing a template type substrate according to claim 26, wherein the the step of annealing is carried out in a single step or in multiple steps until the desired level of impurities (such as hydrogen and/or ammonia or ions formed from the impurities formed during the crystallization and/or annealing process) is reached.

28. A process of preparing a template type substrate according to claim 25, which comprises further step of removing impurities from bulk mono-crystalline nitride by a process of rinsing in the environment of supercritical ammonia-containing solvent, water or carbon dioxide or

being subjected to the action of gaseous hydrogen, nitrogen or ammonia.

29. A process of preparing a template type substrate according to claim 23, wherein the step of rinsing is carried out with aid of the application of ultrasounds or the exposure to an electron beam.